STIC SEARCH

I. PATENT LITERATURE BIBLIOGRAPHIC DATABASES

```
Set     Items   Description
S1       7449   (BLOOD OR HEMO? OR HAEMO?)()(GLUCOSE OR SAMPL? OR
ANALYZ? -
             OR ANALYS?)(3N)(DEVICE? OR APPARATUS? OR INSTRUMENT? OR
TOOL?
             OR IMPLEMENT? OR UTENSIL? OR APPLIANCE? OR MONITOR? OR
TEST? -
             OR ASSAY? OR GAUGE? OR MEASUR? OR SENSOR? OR READ? OR
EVALUAT-
             ?)
S2       2671   GLUCOMETER? OR GLUCOMETRE? OR GLUCOMETRIC? OR (GLUCOSE
OR -
             ANALYTE?)()(SENSOR? OR DETECT?R?) OR GLUCOSE(2N)METER? OR
GLU-
             COS?MET?
S3      11392   (GLUCOSE? OR BLOOD()SUGAR? OR BLOODSUGAR? OR HEMOSUGAR?
OR
             HAEMOSUGAR? OR HEMOGLUCOS? OR HAEMOGLUCOS? OR DIABET? OR
HYPO-
             GLYC? OR HYPERGLYC? OR EUGLYCEM?)(3N)(DEVICE? OR
APPARATUS? OR
              INSTRUMENT? OR TOOL? OR IMPLEMENT? OR UTENSIL? OR
APPLIANCE?
             OR MONITOR? OR TEST? OR ASSAY? OR GAUGE? OR MEASUR? OR
SENSOR?
              OR READ? OR EVALUAT?)
S4      16206   S1:S3
S5       4106   PLURAL? OR MULTITUD? OR MULTI OR MULTIPLE? OR
MULTIPLICIT?
             OR SEVERAL? OR ARRAY? OR MANY
S6         84   MULTIROW? OR NUMEROUS?  OR MULTIARRAY? OR MULTICOLUMN?
OR -
             MULTISTACK? OR MULTIBANK? OR ASSORTED OR ASSORTMENT?
S7       2098   LANCET? OR SHARP OR SHARPS OR NEEDLE? OR PENETRAT? OR
PUNC-
             TUR? OR LANCING? OR TROCAR? OR TREPHIN? OR TREPAN?
S8       2742   PIERC? OR STAB? OR LANCE? ? OR STYLET? OR MICRONEEDLE?
OR -
             SPIKE? OR PERFORAT? OR PRICK?
S9        556   (CUTTING OR INJECT? OR PUNCTUR? OR PENETRAT? OR INTRUD?
OR
             INTRUS? OR PIERC?)(2N)(TOOL? ? OR APPARATUS? OR DEVIC? OR
IMP-
             LEMENT? OR INSTRUMENT? OR APPLIANC? OR HANDTOOL? OR
HANDPIECE?
              OR UTENSIL?)
S10       689   (FLUID? OR BLOOD? OR GLUCOSE? OR INTERSTIT? OR
BIOFLUID?)(-
             )(SAMPL? OR HARVEST?)()(DEVICE? OR INSTRUMENT? OR
IMPLEMENT? -
             OR APPARATUS? OR APPLIANCE? OR TOOL? OR NEEDLE?)
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S11       544   (BIOPSY? OR BIOPSI? OR PUNCTUR? OR PIERC? OR LANCE? OR
LAN-
              CING?)()(DEVICE? OR INSTRUMENT? OR IMPLEMENT? OR
APPARATUS? OR
               APPLIANCE? OR TOOL? OR NEEDLE? OR UTENSIL?)
S12      6428   (FLUID? OR BLOOD? OR GLUCOSE? OR INTERSTIT? OR
BIOFLUID?)(-
              2N)(CAPTUR? OR SPECIMEN? OR SAMPLE? OR SAMPLING? OR
CUTTER? OR
               SEVER OR SEVERS OR SEVERER? OR SEVERING OR SEVERED OR
COLLEC-
              T? OR SLICE? OR SLICING OR PINCH? OR SNAR? OR TRAP?)
S13       118   SPECIMEN?(2N)(CAPTUR? OR SAMPLE? OR SAMPLING? OR
CUTTER? OR
               SEVER OR SEVERS OR SEVERER? OR SEVERING OR SEVERED OR
COLLEC-
              T? OR SLICE? OR SLICING OR SNAR? OR PINCH? OR TRAP?)
S14         1   BIOPS?(3N)(CUTTING OR CUTTER? OR TROCAR? OR PIERC? OR
STAB?
               ? OR STABB? OR PUNCTUR? OR LANCE?)
S15         0   BIOPS?(3N)(SPIKE? OR KNIVE? OR KNIFE? OR LANCING OR
BLADE?
              OR PERFORAT?)
S16         0   BIOPS?(3N)(NANONEEDL? OR MICROPUNCTUR? OR
MICROPENETRAT? OR
               NANOPENETRAT? OR MICROPERFORAT? OR NANOPERFORAT?)
S17         0   BIOPS?(3N)(MICRONEEDLE? OR MICROKNIF? OR MICROBLADE? OR
NA-
              NONEEDLE? OR NANOKNIF? OR NANOKNIV? OR NANOBLADE? OR
MICROLAN-
              C? OR NANOLANC?)
S18         0   BIOPS?(3N)(MICROPIN? ? OR NANOPIN? ? OR MICROPUNCTUR?
OR N-
              ANOPUNCTUR? OR MICROCUTT? OR NANOCUTT? OR MICROPIERC? OR
MICR-
              OSPIK? OR NANOSPIK?)
S19         1   BIOPS?(3N)(BARB?? OR ARROWPOINT? OR PRICK? OR SAGITT?
OR T-
              REPHIN? OR TREPAN? OR STYLET?)
S20         0   BIOPS?(3N)(HANDTOOL? OR HANDPIECE? OR MEMBER? OR
COMPONENT-
              ?)
S21       124   TEST?()ELEMENT?
S22      4320   SENSOR? OR ELECTRONIC(2N)(PICKUP? OR PICK()(UP OR UPS)
OR -
              MONITOR? OR PROBE?)
S23      5802   TRANSDUC?R? OR DETECT?R? OR MONIT?R? OR TELESENS? OR
BIOSE-
              NS? OR BIOMEASUR? OR ELECTROSENSOR?
S24      2263   (SENSE? OR SENSING? OR TRANSDUC? OR DETECT? OR
MONITOR?)(3-
              N)(DEVIC? OR APPLIANC? OR APPARATUS? OR EQUIPMENT? OR
HARDWAR-
              E? OR PERIPHERAL? OR ELEMENT?)
S25      2673   (SENSE? OR SENSING? OR TRANSDUC? OR DETECT? OR
MONITOR?)(3-
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             N)(MODULE? OR UNIT? ? OR COMPONENT? OR HARD()WARE? OR
SYSTEM?
             OR PROCESSOR? OR PROBE? OR ELECTROD?)
S26       187   PICKUP? OR PICK()(UP OR UPS) OR ELECTRONIC?()(MONITOR?
OR -
             INTERROGAT?) OR TRANSPOND? OR TRANSCEIV?
S27       995   PROCESSOR?
S28      1094   CONTROLLER? OR CONTROL?()(DEVICE? OR UNIT? ? OR
MODULE?) OR
              MICROCONTROL? OR MINICONTROL?
S29      1603   DATA()PROCESS? OR SOFTWARE? OR COMPUTER?
S30       715   DATAPROCESS? OR MICRO()PROCESS? OR MICROPROCESS? OR
MINICO-
             MPUTER? OR SERVER? OR CPU OR CPUS
S31       252   CENTRALPROCESSOR? OR CENTRAL()PROCESS? OR
MICROCOMPUTER? OR
              COMPUTING()(DEVICE? OR APPARATUS?)
S32        38   CM3 OR CMSUB3 OR CMSUP3 OR "CM.SUB.3" OR "CM.SUP.3" OR
(CM
              OR CMS OR CENTIMET?)()(SUP OR SUB)()3
S33         4   (CM OR CMS OR CENTIMET?)(2N)(CUBE? OR CUBIC?)
S34      4224   MUL OR MULS OR ML OR MLS OR MILLILIT? OR (MU OR
MILLI)()(L-
             ITER? OR LITRE?) OR UL OR ULS OR LAMBDA?
S35       122   MICROLIT? OR MICRO()(LITER? OR LITRE?) OR MCL OR MCLS
OR (-
             MM OR MILLIMET?)()(CUBE? OR CUBIC?)
S36        91   AU=(FREEMAN D? OR FREEMAN DN OR ALDEN D? OR BOECKER D?
OR -
             BUCKER D? OR FREEMAN, D? OR FREEMAN, DN OR ALDEN, D? OR
BOECK-
             ER, D? OR BOCKER, D?)
S37         4   FREEMAN(2N)(DONIN?) OR ALDEN(2N)(DON OR DONN? OR
DONALD?) -
             OR (BOECKER OR BOCKER)(2N)DIFK)
S38     11480   IC=(A61B? OR G01N? OR G08C? OR G06F? OR G01D?)
S39     13244   MC=(B04? OR B10? OR B11? OR B12? OR P31? OR S02? OR
S03? OR
              S04? OR S05? OR T01? OR W01? OR W05?)
S40      1362   S4 AND S5:S6 AND S7:S20 AND S21:S26
S41        61   S40 AND S36:S37
S42        22   S41 AND S27:S31
S43        22   S42 AND (S32:S35 OR S38:S39)
S44        22   S42:S43
S45        21   S44 AND AY=1950:2003
S46        11   S44 NOT AY=2004:2010
S47        21   S45:S46
S48        21   IDPAT (sorted in duplicate/non-duplicate order)
S49        21   IDPAT (primary/non-duplicate records only)
S50      1341   S40 NOT S47
S51       385   S50 AND S27:S31
S52        42   S51 AND S5:S6(10N)S7:S20 AND S5:S6(10N)S21:S26
S53        42   S52 AND S38:S39
S54        42   S52:S53
S55        15   S54 AND S32:S35
S56        13   S55 AND AY=1950:2003
S57         9   S55 NOT AY=2004:2010
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S58         13   S56:S57
S59         13   IDPAT (sorted in duplicate/non-duplicate order)
S60         13   IDPAT (primary/non-duplicate records only)
S61       1328   S50 NOT S58
S62          1   S61 AND S32:S33 AND S34:S35
S63          1   IDPAT (sorted in duplicate/non-duplicate order)
S64          1   IDPAT (primary/non-duplicate records only)
S65       1327   S61 NOT S62
S66        371   S65 AND S51
S67         15   S55 AND S52
S68         15   S67 AND S27:S31
S69         15   S68 AND S38:S39
S70         15   S68:S69
S71          2   S70 NOT S58
S72          2   IDPAT (sorted in duplicate/non-duplicate order)
S73          2   IDPAT (primary/non-duplicate records only)
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? **show files**

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File 347:JAPIO Dec 1976-2010/May(Updated 100824)
         (c) 2010 JPO & JAPIO
File 350:Derwent WPIX 1963-2010/UD=201056
         (c) 2010 Thomson Reuters
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Dialog eLink: Order File History
49/5,K/1 (Item 1 from file: 350)
DIALOG(R)File 350: Derwent WPIX

Body fluid e.g. blood, sampling system for use on tissue site, has analyte detecting member receiving fluid, and detection member determining concentration of analyte in fluid using sample of less than one micro-liter of fluid

Patent Assignee: ALDEN D (ALDE-I); BOECKER D (BOEC-I); FREEMAN D M (FREE-I); PELIKAN TECHNOLOGIES INC (PELI)

Inventor: **ALDEN D; BOECKER D; FREEMAN D M**

Patent Family (2 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 20080119761	A1	20080522	US 2002127395	A	20020419	200841	B
			US 2002237261	A	20020905		
			US 2002335182	A	20021231		
			US 200823615	A	20080131		
US 7648469	B2	20100119	US 2002127395	A	20020419	201007	E

			US 2002335182	A	20021231		
			US 200823615	A	20080131		
					C-I-P of patent	US 7025774	
					Division of patent	US 7410468	

Alerting Abstract US A1
NOVELTY - The system has an electrically powered drive force generator e.g. voice coil drive force generator, and a **penetrating** member (83) e.g. **lancet**, operatively coupled to the generator. The generator moves the member along a path out of a housing having a **penetrating** member exit, into a tissue site, stopping in and withdrawing out of the site. An analyte detecting member is positioned to receive a fluid from a wound created by the member. A detection member determines the concentration of an analyte e.g. glucose, in the **fluid** using a **sample** of less than one **micro-liter** of the fluid.
USE - Body fluid e.g. **blood**, **sampling** system for use on a tissue site of a patient, for **measuring glucose** level and for detecting presence of antigens.
ADVANTAGE - The system is designed in such a manner that **multiple lancing** events can be performed without the need to remove disposable from the device or for a user to handle **sharps**, and to provide improved **sensing** capabilities. The **system** controls impact, retraction velocity, and dwell time of the **penetrating** member within the tissue in order to achieve high success rate while accommodating variation in skin properties and minimize pain.
DESCRIPTION OF DRAWINGS - The drawing shows a perspective view of a tissue **penetration device**.
80 **Lancing device**
83 **Penetrating** member
85 Drive coupler
88 Driver coil pack
91 Position **sensor**
93 **Processor**

Body fluid e.g. blood, sampling system for use on tissue site, has analyte detecting member receiving fluid, and detection member determining concentration of analyte in fluid using sample of less than one micro-liter of fluid
Abstract ...NOVELTY - The system has an electrically powered drive force generator e.g. voice coil drive force generator, and a **penetrating** member (83) e.g. **lancet**, operatively coupled to the generator. The generator moves the member along a path out of a housing having a **penetrating** member exit, into a tissue site, stopping in and withdrawing out of the site. An analyte detecting member is positioned to receive a fluid from a wound created by the member. A detection member determines the concentration

of an analyte e.g. glucose, in the **fluid** using a **sample** of less than one **micro-liter** of the fluid. USE - Body fluid e.g. **blood**, **sampling** system for use on a tissue site of a patient, for **measuring glucose** level and for detecting presence of antigens... ...ADVANTAGE - The system is designed in such a manner that **multiple lancing events** can be performed without the need to remove disposable from the device or for a user to handle **sharps**, and to provide improved **sensing** capabilities. The **system** controls impact, retraction velocity, and dwell time of the **penetrating** member within the tissue in order to achieve high success rate while accommodating variation in skin properties and minimize pain... ...DESCRIPTION OF DRAWINGS - The drawing shows a perspective view of a tissue **penetration device**. ... ...80 **Lancing device** ... ...83 **Penetrating** member... ...91 Position **sensor** ... ...93 **Processor**

Abstracts: These and other objects of the present invention are achieved in a body **fluid sampling** system for use on a tissue site that includes an electrically powered drive force generator. A **penetrating** member is operatively coupled to the force generator. The force generator moves the member along a path out of a housing having a **penetrating** member exit, into the tissue site, stops in the tissue site, and withdraws out of the tissue site. An analyte detecting member is positioned to receive fluid from a wound created by the **penetrating** member. The detection member is configured to determine a concentration of an analyte in the **fluid** using a **sample** of less than 1 **muL** of the fluid... ... These and other objects of the present invention are achieved in a body **fluid sampling** system for use on a tissue site that includes an electrically powered drive force generator. A **penetrating** member is operatively coupled to the force generator. The force generator moves the member along a path out of a housing having a **penetrating** member exit, into the tissue site, stops in the tissue site, and withdraws out of the tissue site. An analyte detecting member is positioned to receive fluid from a wound created by the **penetrating** member. The detection member is configured to determine a concentration of an analyte in the **fluid** using a **sample** of less than 1 **muL** of the fluid. **Claims:**What is claimed is:**1**. A body **fluid sampling** system for use on a tissue site, the system comprising:an electrically powered drive force generator, wherein the drive force generator is selected from a voice coil drive force generator and a rotary voice coil drive force generator;a **penetrating** member operatively coupled to said force generator, said force generator moving said member along a path out of a housing having a **penetrating** member exit, into said tissue site, stopping in said tissue site, and withdrawing out of said tissue site;an analyte detecting member positioned to receive fluid from a wound created by said **penetrating** member, said detection member configured to determine a concentration of an analyte in the **fluid** using a **sample** of less than 1 **muL** of the fluid... ... What is claimed is: 1. A body **fluid sampling** system for use on a tissue site, the system comprising: an electrically powered drive force generator, wherein the drive force generator is selected from a voice coil drive force generator and a rotary voice coil drive force generator; a **penetrating** member operatively coupled to said force generator, said force generator moving said member along a path out of a housing having a **penetrating** member exit, into said tissue site, stopping in said tissue site, and withdrawing out of said tissue site; an analyte detecting member positioned to receive fluid from a wound created by said **penetrating** member, said detecting member configured to determine a concentration of an analyte in the **fluid** using a **sample** of less than 1 **muL** of the body fluid; a programmable **processor** operatively programmed with **software** that has control

instructions for controlling the drive force generator to provide controlled impact of the **penetrating** member to and through the tissue site, to provide controlled retraction velocity of the **penetrating** member from the tissue site, and to provide controlled dwell time of the **penetrating** member at the tissue site, with the **penetrating** member being withdrawn from the tissue site at a slower speed than a speed of initial **penetration** into the tissue site, and to determine a concentration of the analyte in the fluid using less than 1 **nuL** of the fluid, wherein the control instructions are selected based on at least one of, **penetration** depth of the **penetrating** member and velocity of the **penetrating** member, the programmable **processor** providing a tissue dwell time that is related to an amount of skin deformation as the **penetrating** member tries to **puncture** a surface of the tissue site.

49/5,K/4 (Item 4 from file: 350)
DIALOG(R)File 350: Derwent WPIX

Body fluid, e.g. blood sampling system for use in medical healthcare product, comprises processor varying power to penetrating member driver, and position sensor measuring distance from initialization point to point of contact

Patent Assignee: ALDEN D (ALDE-I); BOECKER D (BOEC-I); FREEMAN D M (FREE-I)
Inventor: **ALDEN D; BOECKER D; FREEMAN D M**

Patent Family (1 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 20070043305	A1	20070222	US 2002127395	A	20020419	200736	B
			US 2002335052	A	20021231		
			US 2006550954	A	20061019		
			C-I-P of patent		US 7025774		

Alerting Abstract US A1

NOVELTY - A body **fluid sampling** system comprises a **penetrating** member driver (316), a set of cartridges (370), and a set of **penetrating** members (312) positioned in a housing. A **processor** coupled to the driver changes a direction and magnitude of a force exerted on the member as the member **penetrates** a target tissue. A position **sensor** measures a distance from an initialization point to the point of contact, where advancement of the member stops a movement of the member. The **processor** modulates the power to the driver, so that an actual velocity profile of the member does not exceed a

preset profile beyond an error limit.
USE - Used in medical healthcare product industry, for performing a self- **test** for **blood glucose** levels, by using a **penetrating** member positioned within a housing selected from a telephone, watch, personal digital assistant (PDA), electronic device, medical device, point of care device and decentralized diagnostic **device** (all claimed), **piercing** into the skin of a diabetic patient.
ADVANTAGE - The position **sensor** measures a distance from the initialization point to the point of contact, where resistance to advancement of the **penetrating** member stops the movement of the **penetrating** member, so as to retract the **penetrating** member to the initialization point having the measured distance to the target tissue without creating any discomfort to the user. The system controls impact, retraction velocity, and dwell time of the **penetrating** member within the target tissue so as to achieve a high success rate while accommodating variations in the skin properties and minimizing the pain. The impact velocities of greater than about two meter per second entry of the **penetrating** member are used, thus reducing the pain caused when **penetrating** the target tissue.
DESCRIPTION OF DRAWINGS - The drawing shows a body sampling system using **multiple** cartridges.
312 **Penetrating** member
316 **Penetrating** member driver
370 Cartridge
400 Enclosure

Body fluid, e.g. blood sampling system for use in medical healthcare product, comprises processor varying power to penetrating member driver, and position sensor measuring distance from initialization point to point of contact

- A body **fluid sampling** system comprises a **penetrating** member driver (316), a set of cartridges (370), and a set of **penetrating** members (312) positioned in a housing. A **processor** coupled to the driver changes a direction and magnitude of a force exerted on the member as the member **penetrates** a target tissue. A position **sensor** measures a distance from an initialization point to the point of contact, where advancement of the member stops a movement of the member. The **processor** modulates the power to the driver, so that an actual velocity profile of the member does not exceed a preset profile beyond an error limit. USE - Used in medical healthcare product industry, for performing a self- **test** for **blood glucose** levels, by using a **penetrating** member positioned within a housing selected from a telephone, watch, personal digital assistant (PDA), electronic device, medical device, point of care device and decentralized diagnostic **device** (all claimed), **piercing** into the skin of a diabetic patient... ...ADVANTAGE - The position **sensor** measures a distance from the initialization point to the point of contact, where resistance to advancement of the **penetrating** member stops the movement of the **penetrating** member, so as to retract the **penetrating** member to the initialization point having the measured distance to the target tissue without creating any discomfort to the user. The system controls impact, retraction velocity, and dwell time of the **penetrating** member within the target tissue so as to achieve a high success rate while accommodating variations in the skin properties and minimizing the pain. The impact velocities of greater

than about two meter per second entry of the **penetrating** member are used, thus reducing the pain caused when **penetrating** the target tissue... ...DESCRIPTION OF DRAWINGS - The drawing shows a body sampling system using **multiple** cartridges... ...312 **Penetrating** member... ...316 **Penetrating** member driver...
Original Abstracts:A body **fluid sampling** system for use on a tissue site has a housing and a **penetrating** member driver at least partially within the housing. At least one cartridge is in the housing. The cartridge includes an **analyte sensor** in a sample chamber configured to receive body fluid from a wound in tissue created by a **penetrating** member. A **penetrating** member is associated with the sample chamber. Each **penetrating** member, and its associated sample chamber, has a combined occupied volume of no more than about 5.0 **cm3**. The **penetrating** member is at least partially co-located with the **analyte sensor** in the sample chamber. The sample chamber receives body fluid from a wound in tissue created by a **penetrating** member, and the **analyte sensor** determines analyte levels using a body **fluid sample** of less than about 1 **microliter**. A transport mechanism engages the cartridge. The **penetrating** member is operatively engaged with the **penetrating** member driver when moved into position by the transport mechanism. The driver provides the force to advance the **penetrating** member. A user interface on the housing displays information to a user. **Claims:**What is claimed is:**1**. A body **fluid sampling** system for use on a tissue site, the system comprising:a voice coil based **penetrating** member driver;a **plurality** of cartridges;a **plurality** of **penetrating** members, each of a **penetrating** member and its associated sample chamber having a combined occupied volume of no more than about 5.0 **cm3**;a transport mechanism configured to engage said cartridges, wherein each of said cartridges are operatively engaged with said **penetrating** member driver when moved into position by said transport mechanism; anda human interface providing at least one output..

49/5,K/15 (Item 15 from file: 350)
DIALOG(R)File 350: Derwent WPIX

Multi-use human body fluid sampling device for medical applications, has cartridge with several penetrating elements which are movable to extend radially outward from cartridge to penetrate tissue

Patent Assignee: BAUSCH & LOMB INC (BAUL); PELIKAN TECHNOLOGIES INC (PELI); ALDEN D (ALDE-I); BOECKER D (BOEC-I); BRIGGS B (BRIG-I); BRIGGS B D (BRIG-I); FREEMAN D (FREE-I); BEADMAN M (BEAD-I); CANE M (CANE-I); FREEMAN D M (FREE-I); SCHUMANN M (SCHU-I)
Inventor: **ALDEN** D; BEADMAN M; **BOECKER D**; BONAFINI J A; BRIGGS B; BRIGGS B D; CAINE M; **FREEMAN D**; **FREEMAN D M**; FREEMAN R; GOGUE G; LAI Y; LEONARD J H; SCHUMANN M; WITTIG M; CANE M

Patent Family (23 patents, 101 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
WO 2003088834	A1	20031030	WO 2003US12381	A	20030421	200379	B
US 20030212424	A1	20031113	US 2002127395	A	20020419	200382	E
			US 2002237261	A	20020905		
AU 2003234167	A1	20031103	AU 2003234167	A	20030421	200438	E
EP 1501409	A1	20050202	EP 2003728475	A	20030421	200510	E
			WO 2003US12381	A	20030421		
JP 2005523065	W	20050804	JP 2003585589	A	20030421	200552	E
			WO 2003US12381	A	20030421		
CN 1662174	A	20050831	CN 2003813961	A	20030421	200607	E
US 7025774	B2	20060411	US 2002127395	A	20020419	200626	E
US 20060241667	A1	20061026	US 2002127395	A	20020419	200671	E
			US 2006388769	A	20060324		
US 7198639	B2	20070403	US 2002237261	A	20020905	200726	E
AU 2003268547	A8	20070215	AU 2003268547	A	20030905	200735	E
US 20070167875	A1	20070719	US 2002127395	A	20020419	200749	E
			US 2002237261	A	20020905		
			US 2002335183	A	20021231		
			US 2007674220	A	20070213		
US 20070219462	A1	20070920	US 2002127395	A	20020419	200763	E
			US 2002237261	A	20020905		
			US 2007735599	A	20070416		
US 20070219463	A1	20070920	US 2002127395	A	20020419	200763	E
			US 2002237261	A	20020905		
			US 2007735817	A	20070416		
US 20070244499	A1	20071018	US 2002127395	A	20020419	200770	E
			US 2002237261	A	20020905		
			US 2007687028	A	20070316		
			US 2007764299	A	20070618		
US 7410468	B2	20080812	US 2002127395	A	20020419	200855	E
			US 2002335182	A	20021231		
US 20080194989	A1	20080814	US 2002127395	A	20020419	200856	E
			US 2002237261	A	20020905		
			US 2007735817	A	20070416		

			US 2008972021	A	20080110			
US 20080214956	A1	20080904	US 2002127395	A	20020419	200859	E	
			US 2002237261	A	20020905			
			US 2007735817	A	20070416			
			US 2008972028	A	20080110			
US 20080287831	A1	20081120	US 2002127395	A	20020419	200903	E	
			US 2002237261	A	20020905			
			US 2007687028	A	20070316			
US 20080300614	A1	20081204	US 2002127395	A	20020419	200918	E	
			US 2002393706	P	20020701			
			US 2002393707	P	20020701			
			US 2002422988	P	20021101			
			US 2002424429	P	20021106			
			US 2002323623	A	20021218			
			US 2007627252	A	20070125			
			US 2008127428	A	20080527			
US 20090131830	A1	20090521	US 2002127395	A	20020419	200934	E	
			US 2002335073	A	20021231			
			US 2008337871	A	20081218			
US 20090112124	A1	20090430	US 2002127395	A	20020419	200938	E	
			US 2002335259	A	20021231			
			US 2008326962	A	20081203			
US 20090112247	A1	20090430	US 2002127395	A	20020419	200938	E	
			US 2002237261	A	20020905			
			US 2002335257	A	20021231			
			US 2008277567	A	20081125			
US 7731729	B2	20100608	US 2002127395	A	20020419	201037	E	
			US 2002237261	A	20020905			
			US 2002335183	A	20021231			
			US 2007674220	A	20070213			

					C-I-P of patent	US 7025774
					C-I-P of patent	US 7344507
					Division of patent	US 7371247

Alerting Abstract WO A1
NOVELTY - A cartridge (244) has several penetrating elements (262) which are operatively coupled to penetrating element driver (246). The elements are movable to extend radially outward from the cartridge to penetrate the tissue. Several optical analyte detectors connected to a cartridge, receive body fluid from tissue in which wound is created by penetrating element.
DESCRIPTION - AN INDEPENDENT CLAIM is also included for the following:

1. multi-use body fluid sampling method;
2. lancing system; and
3. lancing method.

USE - For multi-use body fluid sampling for medical applications.
ADVANTAGE - A multiple lancet solution is provided for measuring analyte levels in body.
DESCRIPTION OF DRAWINGS - The figure shows a perspective view of the multi-use body fluid sampling device.
244 cartridge
246 penetrating element
252 penetrating elements slot
256 base plate
262 penetrating elements

Abstracts:or both of a distal port or a proximal port of the cartridge. A user interface is configured to relay at least one of, skin **penetrating** performance or a skin **penetrating** setting... ... A body **fluid sampling** system for use on a tissue site includes a single drive force generator. A **plurality of penetrating** members are operatively coupled to the force generator. The force generator moves each of the members along a path out of a housing with a **penetrating** member exit, into the tissue site, stops in the tissue site, and withdraws out of the tissue site. A flexible support member couples the **penetrating** members to define a linear **array**. The support member is movable and configured to move each of the **penetrating** members to a launch position associated with the force generator.
A tissue **penetration device** and method of using same. The tissue **penetration device** may optionally include sampling and analyzing functions, which may be integrated. An embodiment provides control of a **lancet** used for **sampling blood**. Electric field coils or solenoids may drive the **lancet** using electromagnetic force. Advancement and retraction of a **lancet** may be controlled by a feedback loop **monitoring** the position and velocity of the **lancet** embodiments of the **lancet** driver can be configured to follow a predetermined tissue **lancing** profile. Embodiments of the invention include a **lancet** and method for using a **lancet** to maintain the patency of the wound tract once the **lancet** has cut into the skin... ... A skin **penetrating** system includes a housing member and a **penetrating**

member positioned in the housing member. An analyte detecting member is coupled to a sample chamber. The analyte detecting member is configured to determine a concentration of an analyte in a body **fluid** using a **sample** of less than 1 **muL** of a body fluid disposed in the sample chamber. A tip of the **penetrating** member is configured to extend through an opening of the sample chamber... ... A tissue **penetrating** system includes a **plurality** of **penetrating** members each having a tip. A **penetrating** member driver is coupled to the **plurality** of **penetrating** members. Each tip of a **penetrating** member is uncovered during launch of the **penetrating** member by the **penetrating** member driver. A support is provided with a **plurality** of openings. Each opening receives a **penetrating** member... ... A device for use with a **penetrating** member (300) driver to **penetrate** tissue is provided. The device includes a single cartridge (12) coupled to a **plurality** of **penetrating** members (18) and operatively couplable to the **penetrating** member (300) driver. The **penetrating** members are movable to extend radially outward from the cartridge (12) to **penetrate** tissue. A **plurality** of optical analyte detecting members (not labeled) are coupled to the single cartridge (12) and positioned to receive body fluid from a wound in the tissue created by the **penetrating** member (262... ... **Claims:**What is claimed is:**1**. A **lancet** driver configured to exert a driving force on a **lancet** during a **lancing** cycle and used on a tissue site, said device comprising:a housing;a drive force generator; anda **processor** coupled to the drive force generator capable of changing the direction and magnitude of force exerted on the **lancet** during the **lancing** cycle; anda human interface on said housing providing at least one output... ... What is claimed is:**1**. A body **fluid sampling** system for use on a tissue site, the system comprising: a container with at least one guide chamber;a driver;a **plurality** of **penetrating** members, at least one sample receiving unit configured to be coupled to the driver and advanced out of the guide chamber of the container and receiving body fluid at a receiving site, wherein a **penetrating** member is integrated with the sample receiving unit to carry out a **lancing** movement towards a body part containing the body fluid... ... What is claimed is:**1**. A tissue **penetrating** system, comprising: a **plurality** of **penetrating** members each with a tip;a **penetrating** member driver coupled to the **plurality** of **penetrating** members; each tip of a **penetrating** member being uncovered during launch of the **penetrating** member by the **penetrating** member driver;a support with a **plurality** of openings, each of an opening receiving a **penetrating** member; anda **penetrating** member position **sensor** coupled to the **plurality** of **penetrating** members and to a **processor**, the **penetrating** member position **sensor** and the **processor** measuring a distance from an initialization point to a point of contact of a **penetrating** member to a target tissue surface, the **penetrating** member being retracted by the **penetrating** member driver to the initialization point with a distance to the target tissue being measured and a depth of **penetration** of the **penetrating** member determined... ... What is claimed is:**1**. A method for producing a combined **puncturing** and measuring **device** for **detection** of an analyte in liquid, including a support with first and second sides, and an **analyte sensor**, comprising: forming recesses which define **puncturing** points on one side of the support;applying an **analyte sensor** to the support; andseparating individual **puncturing**/measuring disposable bodies either singly or in groups from the support at separating lines... ... What is claimed is:**1**. A body **fluid sampling apparatus**, comprising: a housing;a **penetrating** member;a sampling chamber coupled to the **penetrating** member, the sampling chamber positioned to receive a body

fluid from a tissue site in response to **penetration** of the tissue site by the **penetrating** member;resources including a database that includes pressure profiles of users;a pressure **sensor** for sensing and recording a pressure profile of a user... ... What is claimed is:**1**. A method for actuating a bodily fluid extraction device, comprising: providing a **penetrating** member **device** that includes at least one **penetrating** member and sue interface surface;pushing down on at least a portion of the tissue interface surface with a body surface; andapplying pressure on... ... What is claimed is:**1**. A body **fluid sampling apparatus**, comprising: a housing including a tissue interface surface;a **penetrating** member;a sampling chamber coupled to the **penetrating** member, the sampling chamber positioned to receive a body fluid from a tissue site in response to **penetration** of the tissue site by the **penetrating** member;resources including a database that includes pressure profiles of users;a pressure **sensor** positioned at the tissue interface surface for sensing and recording a pressure profile of a user... ... What is claimed is: **1**. A body **fluid sampling apparatus**, comprising: a **plurality** of **penetrating** members; a **penetrating** member actuator coupled to each of a **penetrating** member; a **plurality** of micro sample chambers, each of a **penetrating** member being associated with a micro sample chamber, each of a micro sampling chamber positioned to receive a body fluid from a tissue site in response to **penetration** of the tissue site by a **penetrating** member, and each micro sample chamber having an **analyte sensor**; and a **controller** operable to initiate analyte testing of the body fluid... ... 1. A **lancet** driver configured to exert a driving force on a **lancet** during a **lancing** cycle and used on a tissue site, said device comprising: a housing; a drive force generator; and a **processor** coupled to the drive force generator capable of changing the direction and magnitude of force exerted on the **lancet** during the **lancing** cycle; and a human interface on said housing providing at least one output... ... What is claimed is: **1**. A **multi-lancet** cartridge, comprising: a disk-shaped cartridge housing; a driver positioned in the disk-shaped cartridge housing; a disk-shaped carrier rotationally received in the cartridge housing; a **plurality of penetrating** members carried by the carrier, each of a **penetrating** member having a **lancet** body and a **lancet** tip extending from the body, each of a **penetrating** member being configured to be coupled to a, an advancement device configured to move the disk shaped carrier in a rotational movement in preparation of placing a **lancet** in an active position for being launched to a tissue site; at least one **penetrating** member sterility barrier that provides a sterile environment for a tip of a **penetrating** member; a **device** that removes the at least one **penetrating** member sterility barrier out of a path of travel from the **penetrating** member upon launch of the **penetrating** member while at the active position... ... What is claimed is: **1**. A skin **penetrating** system, comprising: a housing member; a **plurality** of **penetrating** members positioned in the housing member, a **penetrating** member driver coupled to the **plurality** of **penetrating** members; a **plurality** of analyte detecting members each associated with a **penetrating** member, each analyte detecting member including a sample chamber and an opening for transport of a body **fluid** into the **sample** chamber, the analyte detecting member being configured to determine a concentration of an analyte in a body **fluid** using a **sample** of less than 1 **muL** of a body fluid disposed in the sample chamber; and a human interface providing at least one output... ... 1. A tissue **penetrating** system, comprising: a **plurality** of cartridges each with a distal port and a proximal port; a **plurality** of **penetrating** members each coupled to a cartridge, each **penetrating** member having a sharpened distal tip and a shaft portion slidably disposed

within the cartridge; a seal formed by a fracturable material between the **penetrating** member and the cartridge, the seal being positioned at least one of a distal port or a proximal port of the cartridge; and a human... ... What is claimed is: **1**. A body **fluid sampling** system for use on a tissue site, the system comprising: a single drive force generator; a **plurality** of **penetrating** members operatively coupled to said force generator, said force generator moving each of said members along a path out of a housing having a **penetrating** member exit, into said tissue site, stopping in said tissue site, and withdrawing out of said tissue site; a flexible support member coupling said **penetrating** members to define a linear **array**, said support member being movable and configured to move each of said **penetrating** members to a launch position associated with said force generator; and a **plurality** of cartridges integrated in a cassette, wherein each of said cartridges houses one of said **penetrating** members; and a **penetrating** member **sensor** is positioned to **monitor** a **penetrating** member coupled to said force generator, the **penetrating** member **sensor** configured to provide information relative to a depth of **penetration** of a **penetrating** member through a skin surface... ... What is claimed is:1. A method of **lancing** the skin of a patient to bring a **blood sample** to a tissue surface, the method comprising:(a) providing a tissue **penetration** element having a tip configured to **penetrate** tissue;(b) disposing the tissue **penetration** element in proximity to the tissue of the patient;(c) driving the tissue **penetration** element distally towards the tissue of the patient;(d) making contact between the tip and the tissue of the patient;(e) advancing the tip into the tissue during a **penetration** stroke to a position of maximum inward displacement;(f) displacing the tissue **penetration** element proximally over a withdrawal stroke at an average velocity that is substantially lower than an average velocity of the tissue **penetration** element during the **penetration** stroke, wherein the average velocity of the tissue **penetration** element during the **penetration** stroke is about 100 to about 1000 times greater than the average velocity of the tissue **penetration** member during the withdrawal stroke; and(g) withdrawing the tissue **penetration** element during a withdrawal stroke at a maximum velocity of up to about 0.02 meters per second... ... What is claimed is:1. A skin **penetrating** system, comprising: a housing member;an electronic drive force generator;a **plurality** of **penetrating** members positioned in the housing member, each of a **penetrating** member being couplable to the drive force generator;a **plurality** of sample chambers, each sample chamber including electrodes, having a volume no greater than 1 **muL** and an **analyte sensor**, each of a sample chamber being positioned to receive fluid from a wound created by a **penetrating** member, and determine a concentration of an analyte in a **fluid** using a **sample** of less than 1 **muL** of the fluid, wherein when the **penetrating** member is removed from the sample chamber, the electrodes remain in the sample chamber and the volume of the sample chamber is less than 1 **muL** wherein a tip of the **penetrating** member is configured to extend through an opening of a sample chamber, wherein each **penetrating** member of the **plurality** of **penetrating** members has a packing density of no more than 1.0 **cm3/penetrating** member;a single substrate that supports the **plurality** of **penetrating** members and the **plurality** of sample chambers, the single substrate being rotatably positioned in the housing to position each of a **penetrating** member in a launch position to **penetrate** a tissue site, and then rotate to a next position for a launch position of a next **penetrating** member; anda programmable **processor** operatively programmed with **software** that has control instructions for controlling the drive force generator, to

keep a wound tract created by a **penetrating** member open for a sufficient time to provide for spontaneous flow of **blood** for **sample capture** into an associated sample chamber, the control instructions selected from at least one of, **penetration** depth of a **penetrating** member, velocity of a **penetrating** member, velocity of a **penetrating** member in or out of target tissue and a dwell time of a **penetrating** member in the target tissue... ... A tissue **penetration device**, comprising: a **penetrating** member driver; a cartridge; a **plurality** of **penetrating** members integrated with the cartridge, each of a **penetrating** member coupled to the **penetrating** member driver when advanced along a path into a tissue target; and a support with a **plurality** of openings, each opening receiving a **penetrating** member, each tip of a **penetrating** member being uncovered during launch of a **penetrating** member by the **penetrating** driver member; and a **penetrating** member position **sensor** coupled to the **plurality** of **penetrating** members and to a **processor**, the **penetrating** member position **sensor** and the **processor** measuring a distance from an initialization point to a point of contact of a **penetrating** member to a target tissue surface, the **penetrating** member being retracted by the **penetrating** member driver to the initialization point with a distance to the target tissue being measured and a depth of **penetration** of the **penetrating** member determined.

49/5,K/17 (Item 17 from file: 350)
DIALOG(R)File 350: Derwent WPIX

Tissue penetrating system for blood analysis, has sensor providing information relative to depth of penetration of penetrating component, and tissue stabilizer component to enhance fluid flow from target tissue

Patent Assignee: PELIKAN TECHNOLOGIES INC (PELI)
Inventor: **ALDEN D; BOECKER D; FREEMAN D M**

Patent Family (2 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 20030199902	A1	20031023	US 2002127395	A	20020419	200379	B
			US 2002335212	A	20021231		
US 7547287	B2	20090616	US 2002127395	A	20020419	200940	E
			US 2002237261	A	20020905		
			US 2002335212	A	20021231		
			C-I-P of patent	US 7025774			
			C-I-P of patent	US 7344507			

Alerting Abstract US A1
NOVELTY - The system (310) has **penetrating** components (312) positioned in a housing unit. A tissue-**stabilizing** component is coupled to the housing. A **penetrating** component **sensor** is coupled to the **penetrating** components. The **sensor** provides information relative to a depth of **penetration** of the **penetrating** components through a skin surface. The tissue **stabilizer** component enhances fluid flow from a target tissue.
DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of obtaining a sample of capillary whole blood from a target tissue.
USE - Used for **penetrating** tissues to produce blood for analysis.
ADVANTAGE - The system reduces pain when **penetrated** into the target tissue, and also provides a controlled depth of **penetration** and controlled velocities into and out of the target tissue.
DESCRIPTION OF DRAWINGS - The drawing shows a device for use on a tissue site, having **penetrating** components.
310 Tissue **penetrating** system
312 **Penetrating** components
314 **Penetrating** tip
316 Driver
318 Coupler

Tissue penetrating system for blood analysis, has sensor providing information relative to depth of penetration of penetrating component, and tissue stabilizer component to enhance fluid flow from target tissue
Abstract ...NOVELTY - The system (310) has **penetrating** components (312) positioned in a housing unit. A tissue-**stabilizing** component is coupled to the housing. A **penetrating** component **sensor** is coupled to the **penetrating** components. The **sensor** provides information relative to a depth of **penetration** of the **penetrating** components through a skin surface. The tissue **stabilizer** component enhances fluid flow from a target tissue. ...USE - Used for **penetrating** tissues to produce blood for analysis ... ...ADVANTAGE - The system reduces pain when **penetrated** into the target tissue, and also provides a controlled depth of **penetration** and controlled velocities into and out of the target tissue... ...DESCRIPTION OF DRAWINGS - The drawing shows a device for use on a tissue site, having **penetrating** components... ...310 Tissue **penetrating** system... ...312 **Penetrating** components... ...314 **Penetrating** tip...
Original Abstracts:A tissue **penetrating** system has a housing member. A **plurality** of **penetrating** members are positioned in the housing member. A tissue **stabilizing** member is coupled to the housing. A **penetrating** member **sensor** is coupled to the **plurality** of **penetrating** members. The **penetrating** member **sensor** is configured to provide information relative to a depth of **penetration** of a **penetrating** member through a skin surface... ... A tissue **penetrating** system has a housing member. A **plurality** of **penetrating** members are positioned in the housing member. A tissue **stabilizing** member is coupled to the housing. A **penetrating** member **sensor** is coupled to the **plurality** of **penetrating** members. The **penetrating** member **sensor** is configured to

provide information relative to a depth of **penetration** of a **penetrating** member through a skin surface. **Claims:**What is claimed is:**1**. A tissue **penetrating** system, comprising:a housing member;a **plurality** of **penetrating** members positioned in the housing member,a tissue **stabilizing** member coupled to the housing; anda **penetrating** member **sensor** coupled to the **plurality** of **penetrating** members, the **penetrating** member **sensor** configured to provide information relative to a depth of **penetration** of a **penetrating** member through a skin surface... ... What is claimed is: 1. A tissue **penetrating** system, comprising: a housing member; an electrically driven drive force generator; a **plurality** of **penetrating** members positioned in the housing member, wherein each of the **penetrating** members is coupled to the drive force generator; a tissue **stabilizing** member coupled to the housing and configured to **stabilize** tissue prior to a **lancing** event; a **penetrating** member position **sensor** coupled to the **plurality** of **penetrating** members and measures actual depth of **penetration** by a **penetrating** member based on a **penetrating** member contact point that is measured prior to a **lancing** event, a **processor** coupled to the **penetrating** member **sensor** and the drive force generator, operatively programmed with **software** that has control instructions for the electronically driven drive force generator to keep a wound tract created by a **penetrating** member open for a sufficient time to provide for spontaneous flow of **blood** for **sample capture** into an associated sample with a controlled blood volume of no more than 1 **mcL**, wherein the control instructions are selected from at least one of, velocity of a **penetrating** member, velocity of a **penetrating** member in or out of target tissue and a dwell time of a **penetrating** member in the tissue site; and wherein a time and position of tissue contact and depth of **penetration** is determined in response to the **processor** knowing, a distance of the **penetrating** member tip from a target tissue, acceleration and displacement of a **penetrating** member, and a start position of the **penetrating** member.

49/5,K/18 (Item 18 from file: 350)
DIALOG(R)File 350: Derwent WPIX

Body fluid sampling system used for e.g. monitoring glucose level in blood, has processor that controls launching force applied to penetrating element, so that penetrating element penetrates target tissue within set speed range
Patent Assignee: PELIKAN TECHNOLOGIES INC (PELI)
Inventor: **ALDEN D; BOECKER D; FREEMAN D M**

Patent Family (2 patents, 1 countries)							
Patent Number	**Kind**	**Date**	**Application Number**	**Kind**	**Date**	**Update**	**Type**
US 20030199896	A1	20031023	US 2002127395	A	20020419	200379	B
			US 2002237261	A	20020905		

			US 2002335073	A	20021231		
US 7524293	B2	20090428	US 2002127395	A	20020419	200932	E
			US 2002335073	A	20021231		
				C-I-P of patent	US 7025774		

Alerting Abstract US A1
NOVELTY - A flexible support element couples **penetrating** elements (312) to define a linear **array**. Each **penetrating** element is moved to launch position by a force generator (316). A **processor** controls launching force applied to the **penetrating** element, so that the **penetrating** element **penetrates** target tissue (320) within set speed range.
USE - For **monitoring glucose** level in and antigen in blood and analyte in other body fluid.
ADVANTAGE - Enables **penetrating** the target tissue with reduced pain.
DESCRIPTION OF DRAWINGS - The figure shows the perspective view of body **fluid sampling** system.
310 **blood fluid sampling** system
312 **penetrating** elements
316 **penetrating** element driver
320 target tissue

Body fluid sampling system used for e.g. monitoring glucose level in blood, has processor that controls launching force applied to penetrating element, so that penetrating element penetrates target tissue within set speed range
Abstract ...NOVELTY - A flexible support element couples **penetrating** elements (312) to define a linear **array**. Each **penetrating** element is moved to launch position by a force generator (316). A **processor** controls launching force applied to the **penetrating** element, so that the **penetrating** element **penetrates** target tissue (320) within set speed range. USE - For **monitoring glucose** level in and antigen in blood and analyte in other body fluid... ...ADVANTAGE - Enables **penetrating** the target tissue with reduced pain... ...DESCRIPTION OF DRAWINGS - The figure shows the perspective view of body **fluid sampling** system... ...310 **blood fluid sampling** system... ...312 **penetrating** elements... ...316 **penetrating** element driver...
Abstracts:A body **fluid sampling** system for use on a tissue site includes a single drive force generator. A **plurality** of **penetrating** members are operatively coupled to the force generator. The force generator moves each of the members along a path out of a housing with a **penetrating** member exit, into the tissue site, stops in the tissue site, and withdraws out of the tissue site. A flexible support member couples the **penetrating** members to define a linear **array**. The support member is movable and configured to move each of the **penetrating** members to a launch position associated with the force generator... ... A body **fluid sampling** system for use on a tissue site includes a single

drive force generator. A **plurality** of **penetrating** members are operatively coupled to the force generator. The force generator moves each of the members along a path out of a housing with a **penetrating** member exit, into the tissue site, stops in the tissue site, and withdraws out of the tissue site. A flexible support member couples the **penetrating** members to define a linear **array**. The support member is movable and configured to move each of the **penetrating** members to a launch position associated with the force generator. **Claims:**What is claimed is:**1**. A body **fluid sampling** system for use on a tissue site, the system comprising:a single drive force generator;a **plurality** of **penetrating** members operatively coupled to said force generator, said force generator moving each of said members along a path out of a housing having a **penetrating** member exit, into said tissue site, stopping in said tissue site, and withdrawing out of said tissue site;a flexible support member coupling said **penetrating** members to define a linear **array**, said support member being movable and configured to move each of said **penetrating** members to a launch position associated with said force generator... ... What is claimed is: 23. A body **fluid sampling** system for use on a tissue site, the system comprising: a single drive force generator; a housing including a **plurality** of **analyte sensors** and a **plurality** of sample chambers, each of an **analyte sensor** being associated with a sample chamber that does not exceed 1 **nuL**; each **analyte sensor** and associated sample chamber positioned and sized to receive body fluid from a wound in tissue created by a **penetrating** member; a **plurality** of **penetrating** members operatively coupled to said force generator, said force generator moving each of said members along a path out of the housing into the tissue site, stopping in the tissue site, and withdrawing out of said tissue site; a flexible support member coupling the **penetrating** members at the flexible support member to form an **array** of **penetrating** members and positioned to move each of said **penetrating** members to a launch position associated with said force generator; and each of a **penetrating** member at least partially positioned adjacent to an **analyte sensor** in a sample chamber, each sample chamber positioned to receive body fluid from a wound in tissue created by a **penetrating** member, and each **analyte sensor** interacting with the body fluid to determining analyte levels; and a **penetrating** member **sensor** positioned to **monitor** a **penetrating** member coupled to said force generator, the **penetrating** member **sensor** in communication with a **processor** providing information relative to a depth of **penetration** of a **penetrating** member through a skin surface, the **penetrating** member **sensor** being coupled to a **processor** with control instructions for the single drive force generator, the **processor** being utilized to **monitor** position and speed of a **penetrating** member as the **penetrating** member moves in the first direction toward a target tissue and control a withdraw force to the **penetrating** member so that the **penetrating** member moves in a second direction away from the target tissue, wherein the application of a launching force to the **penetrating** member is controlled based on position and speed of the **penetrating** member; and wherein the average velocity of the **penetrating** member during a tissue **penetration** stroke in a first direction is about 100 to about 1000 times greater than the average velocity of the **penetrating** member during a withdrawal stroke in a second direction.

49/5,K/19 (Item 19 from file: 350)

Body fluid sampling system for tissue sites, has analyte detecting unit to receive fluid from wound created by penetrating unit and find concentration of analyte in fluid using sample of less than one milliliter of fluid

Patent Assignee: PELIKAN TECHNOLOGIES INC (PELI)
Inventor: **ALDEN D; BOECKER D; FREEMAN D M**

Patent Family (2 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 20030199899	A1	20031023	US 2002127395	A	20020419	200378	B
			US 2002237261	A	20020905		
			US 2002335142	A	20021231		
US 7374544	B2	20080520	US 2002127395	A	20020419	200836	E
			US 2002335142	A	20021231		
			C-I-P of patent	US 7025774			

Alerting Abstract US A1
NOVELTY - The system has a powered drive force generator to move a **penetrating** unit (83) along a path out of a housing having a **penetrating** unit exit into a tissue site, stopping in the site, and withdrawing out of the site. An analyte **detecting unit** in a cartridge receives fluid from a wound created by the **penetrating** unit and finds a concentration of the analyte in the **fluid** using a **sample** of less than 1 **milliliter** of the fluid.
USE - Used for **sampling** body **fluid** in tissue sites.
ADVANTAGE - The **penetrating** unit with an optional high density design consistently creates a wound with spontaneous body fluid flow from a diabetic patient that can be used for **multiple lancing** events, without having to remove a disposable from the **penetrating** unit or for the user to handle **sharps**. The **system** provides improved **sensing** capabilities.
DESCRIPTION OF DRAWINGS - The drawing shows an elevation view in partial longitudinal section of a tissue **penetrating device**.
80 **Lancing device**
83 **Penetrating** unit (84) Coupler shaft
85 Drive coupler
98 Drive head

102 Magnetic unit

Body fluid sampling system for tissue sites, has analyte detecting unit to receive fluid from wound created by penetrating unit and find concentration of analyte in fluid using sample of less than one milliliter of fluid

Abstract ...NOVELTY - The system has a powered drive force generator to move a **penetrating** unit (83) along a path out of a housing having a **penetrating** unit exit into a tissue site, stopping in the site, and withdrawing out of the site. An analyte **detecting unit** in a cartridge receives fluid from a wound created by the **penetrating** unit and finds a concentration of the analyte in the **fluid** using a **sample** of less than 1 **milliliter** of the fluid. USE - Used for **sampling** body **fluid** in tissue sites... ...ADVANTAGE - The **penetrating** unit with an optional high density design consistently creates a wound with spontaneous body fluid flow from a diabetic patient that can be used for **multiple lancing** events, without having to remove a disposable from the **penetrating** unit or for the user to handle **sharps**. The **system** provides improved **sensing** capabilities... ...DESCRIPTION OF DRAWINGS - The drawing shows an elevation view in partial longitudinal section of a tissue **penetrating device**. ... ...80 **Lancing device** ... ...83 **Penetrating** unit (84) Coupler shaft

Abstracts: These and other objects of the present invention are achieved in a body **fluid sampling** system for use on a tissue site that includes an electrically powered drive force generator. A **penetrating** member is operatively coupled to the force generator. The force generator moves the member along a path out of a housing having a **penetrating** member exit, into the tissue site, stops in the tissue site, and withdraws out of the tissue site. An analyte detecting member is positioned to receive fluid from a wound created by the **penetrating** member. The detection member is configured to determine a concentration of an analyte in the **fluid** using a **sample** of less than 1 **mL** of the fluid... ... These and other objects of the present invention are achieved in a body **fluid sampling** system for use on a tissue site that includes an electrically powered drive force generator. A **penetrating** member is operatively coupled to the force generator. The force generator moves the member along a path out of a housing having a **penetrating** member exit, into the tissue site, stops in the tissue site, and withdraws out of the tissue site. An analyte detecting member is positioned to receive fluid from a wound created by the **penetrating** member. The detection member is configured to determine a concentration of an analyte in the **fluid** using a **sample** of less than 1 **mL** of the fluid. **Claims:**What is claimed is:**1**. A body **fluid sampling** system for use on a tissue site, the system comprising:an electrically powered drive force generator;a **penetrating** member operatively coupled to said force generator, said force generator moving said member along a path out of a housing having a **penetrating** member exit, into said tissue site, stopping in said tissue site, and withdrawing out of said tissue site;an analyte detecting member positioned to receive fluid from a wound created by said **penetrating** member, said detection member configured to determine a concentration of an analyte in the **fluid** using a **sample** of less than 1 **mL** of the fluid... ... What is claimed is:1. A body **fluid sampling** system for use on a tissue site, the system comprising: a controllable, electrically powered drive force generator;a **penetrating** member operatively coupled to said controllable, electrically

powered drive force generator, said controllable, electrically powered force generator moving said **penetrating** member along a path out of a housing having a **penetrating** member exit, into said tissue site, stopping in said tissue site, and withdrawing out of said tissue site; anda sample chamber that includes electrodes, has a volume no greater than 1 **muL** and has an **analyte sensor**, the sample chamber being positioned to receive fluid from a wound created by said **penetrating** member, and the **analyte sensor** and determine a concentration of an analyte in a **fluid** using a **sample** of less than 1 **muL** of the fluid, wherein when the **penetrating** member is removed from the sample chamber, the electrodes remain in the sample chamber and the volume of the sample chamber is less than 1 **muL** anda **penetrating** member **sensor** coupled to said controllable, electrically powered drive force generator and to a programmable **processor**, the **penetrating** member **sensor** configured to provide information relative to a depth of **penetration** of a **penetrating** member through a skin surface, the programmable **processor** operatively programmed with **software** that has control instructions for the controllable, electrically powered drive force generator to keep a wound tract created by a **penetrating** member open for a sufficient time to provide for spontaneous flow of **blood** for **sample capture** into an associated sample chamber, wherein the control instructions are selected from at least one of, **penetration** depth of a **penetrating** member, velocity of a **penetrating** member, velocity of a **penetrating** member in or out of target tissue and a dwell time of a **penetrating** member in the tissue site.

II. NON PATENT LITERATURE BIBLIOGRAPHIC DATABASES

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Set     Items   Description
S1     113381   (BLOOD OR HEMO? OR HAEMO?)()(GLUCOSE OR SAMPL? OR
ANALYZ? -
             OR ANALYS?)(3N)(DEVICE? OR APPARATUS? OR INSTRUMENT? OR
TOOL?
             OR IMPLEMENT? OR UTENSIL? OR APPLIANCE? OR MONITOR? OR
TEST? -
             OR ASSAY? OR GAUGE? OR MEASUR? OR SENSOR? OR READ? OR
EVALUAT-
             ?)
S2      25847   GLUCOMETER? OR GLUCOMETRE? OR GLUCOMETRIC? OR (GLUCOSE
OR -
             ANALYTE?)()(SENSOR? OR DETECT?R?) OR GLUCOSE(2N)METER? OR
GLU-
             COS?MET?
S3     350444   (GLUCOSE? OR BLOOD()SUGAR? OR BLOODSUGAR? OR HEMOSUGAR?
OR
             HAEMOSUGAR? OR HEMOGLUCOS? OR HAEMOGLUCOS? OR DIABET? OR
HYPO-
             GLYC? OR HYPERGLYC? OR EUGLYCEM?)(3N)(DEVICE? OR
APPARATUS? OR
              INSTRUMENT? OR TOOL? OR IMPLEMENT? OR UTENSIL? OR
APPLIANCE?
             OR MONITOR? OR TEST? OR ASSAY? OR GAUGE? OR MEASUR? OR
SENSOR?
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              OR READ? OR EVALUAT?)
S4     418206   S1:S3
S5      51616   PLURAL? OR MULTITUD? OR MULTI OR MULTIPLE? OR
MULTIPLICIT?
              OR SEVERAL? OR ARRAY? OR MANY
S6       1944   MULTIROW? OR NUMEROUS?  OR MULTIARRAY? OR MULTICOLUMN?
OR -
              MULTISTACK? OR MULTIBANK? OR ASSORTED OR ASSORTMENT?
S7       5312   LANCET? OR SHARP OR SHARPS OR NEEDLE? OR PENETRAT? OR
PUNC-
              TUR? OR LANCING? OR TROCAR? OR TREPHIN? OR TREPAN?
S8      21385   PIERC? OR STAB? OR LANCE? ? OR STYLET? OR MICRONEEDLE?
OR -
              SPIKE? OR PERFORAT? OR PRICK?
S9        497   (CUTTING OR INJECT? OR PUNCTUR? OR PENETRAT? OR INTRUD?
OR
              INTRUS? OR PIERC?)(2N)(TOOL? ? OR APPARATUS? OR DEVIC? OR
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              LEMENT? OR INSTRUMENT? OR APPLIANC? OR HANDTOOL? OR
HANDPIECE?
               OR UTENSIL?)
S10       509   (FLUID? OR BLOOD? OR GLUCOSE? OR INTERSTIT? OR
BIOFLUID?)(-
              )(SAMPL? OR HARVEST?)()(DEVICE? OR INSTRUMENT? OR
IMPLEMENT? -
              OR APPARATUS? OR APPLIANCE? OR TOOL? OR NEEDLE?)
S11       257   (BIOPSY? OR BIOPSI? OR PUNCTUR? OR PIERC? OR LANCE? OR
LAN-
              CING?)()(DEVICE? OR INSTRUMENT? OR IMPLEMENT? OR
APPARATUS? OR
               APPLIANCE? OR TOOL? OR NEEDLE? OR UTENSIL?)
S12     72028   (FLUID? OR BLOOD? OR GLUCOSE? OR INTERSTIT? OR
BIOFLUID?)(-
              2N)(CAPTUR? OR SPECIMEN? OR SAMPLE? OR SAMPLING? OR
CUTTER? OR
               SEVER OR SEVERS OR SEVERER? OR SEVERING OR SEVERED OR
COLLEC-
              T? OR SLICE? OR SLICING OR PINCH? OR SNAR? OR TRAP?)
S13      1101   SPECIMEN?(2N)(CAPTUR? OR SAMPLE? OR SAMPLING? OR
CUTTER? OR
               SEVER OR SEVERS OR SEVERER? OR SEVERING OR SEVERED OR
COLLEC-
              T? OR SLICE? OR SLICING OR SNAR? OR PINCH? OR TRAP?)
S14         3   BIOPS?(3N)(CUTTING OR CUTTER? OR TROCAR? OR PIERC? OR
STAB?
               ? OR STABB? OR PUNCTUR? OR LANCE?)
S15         3   BIOPS?(3N)(SPIKE? OR KNIVE? OR KNIFE? OR LANCING OR
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              OR PERFORAT?)
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               NANOPENETRAT? OR MICROPERFORAT? OR NANOPERFORAT?)
S17         0   BIOPS?(3N)(MICRONEEDLE? OR MICROKNIF? OR MICROBLADE? OR
NA-
              NONEEDLE? OR NANOKNIF? OR NANOKNIV? OR NANOBLADE? OR
MICROLAN-
              C? OR NANOLANC?)
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S18          0   BIOPS?(3N)(MICROPIN? ? OR NANOPIN? ? OR MICROPUNCTUR?
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             ANOPUNCTUR? OR MICROCUTT? OR NANOCUTT? OR MICROPIERC? OR
MICR-
             OSPIK? OR NANOSPIK?)
S19          1   BIOPS?(3N)(BARB?? OR ARROWPOINT? OR PRICK? OR SAGITT?
OR T-
             REPHIN? OR TREPAN? OR STYLET?)
S20          5   BIOPS?(3N)(HANDTOOL? OR HANDPIECE? OR MEMBER? OR
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             ?)
S21        190   TEST?()ELEMENT?
S22      39180   SENSOR? OR ELECTRONIC(2N)(PICKUP? OR PICK()(UP OR UPS)
OR -
             MONITOR? OR PROBE?)
S23      85309   TRANSDUC?R? OR DETECT?R? OR MONIT?R? OR TELESENS? OR
BIOSE-
             NS? OR BIOMEASUR? OR ELECTROSENSOR?
S24       4880   (SENSE? OR SENSING? OR TRANSDUC? OR DETECT? OR
MONITOR?)(3-
             N)(DEVIC? OR APPLIANC? OR APPARATUS? OR EQUIPMENT? OR
HARDWAR-
             E? OR PERIPHERAL? OR ELEMENT?)
S25      10854   (SENSE? OR SENSING? OR TRANSDUC? OR DETECT? OR
MONITOR?)(3-
             N)(MODULE? OR UNIT? ? OR COMPONENT? OR HARD()WARE? OR
SYSTEM?
             OR PROCESSOR? OR PROBE? OR ELECTROD?)
S26        185   PICKUP? OR PICK()(UP OR UPS) OR ELECTRONIC?()(MONITOR?
OR -
             INTERROGAT?) OR TRANSPOND? OR TRANSCEIV?
S27        185   PROCESSOR?
S28        998   CONTROLLER? OR CONTROL?()(DEVICE? OR UNIT? ? OR
MODULE?) OR
              MICROCONTROL? OR MINICONTROL?
S29      14604   DATA()PROCESS? OR SOFTWARE? OR COMPUTER?
S30        679   DATAPROCESS? OR MICRO()PROCESS? OR MICROPROCESS? OR
MINICO-
             MPUTER? OR SERVER? OR CPU OR CPUS
S31        482   CENTRALPROCESSOR? OR CENTRAL()PROCESS? OR
MICROCOMPUTER? OR
              COMPUTING()(DEVICE? OR APPARATUS?)
S32        161   CM3 OR CMSUB3 OR CMSUP3 OR "CM.SUB.3" OR "CM.SUP.3" OR
(CM
              OR CMS OR CENTIMET?)()(SUP OR SUB)()3
S33          7   (CM OR CMS OR CENTIMET?)(2N)(CUBE? OR CUBIC?)
S34      33899   MUL OR MULS OR ML OR MLS OR MILLILIT? OR (MU OR
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             ITER? OR LITRE?) OR UL OR ULS OR LAMBDA?
S35        496   MICROLIT? OR MICRO()(LITER? OR LITRE?) OR MCL OR MCLS
OR (-
             MM OR MILLIMET?)()(CUBE? OR CUBIC?)
S36         65   AU=(FREEMAN D? OR FREEMAN DM OR ALDEN D? OR BOECKER EW
OR -
             BOCKER D? OR FREEMAN, D? OR FREEMAN, DM OR ALDEN, D? OR
BOECK-
             ER, D? OR BOCKER, D?)
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S37 0 FREEMAN(3N)(EQUIN?) OR ALDER(3N)(EQU OR EQUN? OR EQUALC?) OR
(BOECKER OR ECCREP)(3N)DIFF?
S38 4184 IC=(A61B? OR G01N? OR G08C? OR G06F? OR G01D?)
S39 0 MC=(B04? OR B10? OR B11? OR B12? OR P31? OR S02? OR S03? OR
S04? OR S05? OR T01? OR W01? OR W05?)
S40 4059 S4 AND S5:S6 AND S7:S20 AND S21:S26
S41 5 S40 AND S36:S37
S42 3 RD (unique items)
S43 4054 S40 NOT S41
S44 263 S43 AND S27:S31
S45 524 S43 AND S32:S35
S46 85 S43 AND S38:S39
S47 17 S44 AND S45
S48 32 S44:S45 AND S46
S49 0 S47 AND S48
S50 49 S47:S49
S51 22 S50 AND PY=1950:2003
S52 25 S50 NOT PY=2004:2010
S53 25 S51:S52
S54 19 RD (unique items)
S55 745 S44:S45 NOT S53
S56 505 S55 AND S34:S35
S57 3 S55 AND S32:S33
S58 3 RD (unique items)
S59 504 S56 NOT S57
S60 0 S59 AND S5:S6(7N)S7:S20 AND S5:S6(7N)S21:S26 AND S27:S31
S61 4 S59 AND S27:S31
S62 4 RD (unique items)

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42/5,K/2 (Item 2 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)

0021123838 **Biosis No.:** 200900465275
Integrated blood sampling analysis system with multi -use sampling module

Author: Freeman Dominique M; Anonymous; Mauze Ganapati; Boecker Dirk
Author Address: La Honda, CA USA**USA
Journal: Official Gazette of the United States Patent and Trademark Office Patents MAY 26 2009 2009
Patent Number: US 07537571 **Patent Date Granted:** May 26, 2009 20090526 **Patent Classification:** 600-583 **Patent Assignee:** Pelikan Technologies Inc **Patent Country:** USA

ISSN: 0098-1133
Document Type: Patent
Record Type: Abstract
Language: English

Abstract: A simple, miniaturized, disposable acquisition and **test module** for **monitoring glucose** or other analytes successively for **multiple** times is described. The apparatus is designed to collect and test small volumes of blood in a single step. **Many** samples can be acquired and analyzed using a single disposable sampling module, minimizing the number of disposables and improving ease of use of the system.

DESCRIPTORS:
Major Concepts: Human Medicine--Medical Sciences; Equipment Apparatus Devices and Instrumentation
Methods & Equipment: integrated **blood sampling** analysis system containing **multi**-use sampling module--medical equipment
Concept Codes:
12502 Pathology - General
Integrated blood sampling analysis system with multi -use sampling module

Author: Freeman Dominique M... ...**Boecker Dirk**

Abstract: A simple, miniaturized, disposable acquisition and **test module** for **monitoring glucose** or other analytes successively for **multiple** times is described. The apparatus is designed to collect and test small volumes of blood in a single step. **Many** samples can be acquired and analyzed using a single disposable sampling module, minimizing the number of disposables and improving ease of use of the system.
DESCRIPTORS:
Methods & Equipment: integrated **blood sampling** analysis system containing **multi**-use sampling module...
Geographical Name:

9. A method of collecting and testing a series of blood samples, the method comprising a) obtaining a disc shaped sampling module that is radially portioned into a plurality of sampling segments with sample test chambers, and a reader device, each sampling segment adapted to perform a single blood sampling cycle of lancing, collecting, communicating in fluid form, and testing of a blood sample, the sampling module coupled to a rotation device to rotate the sampling module into position for a new sampling event, each of a sample test chamber in fluid communication with a sampling port via a capillary channel with a diameter that is less than 0.1 mm, the sample test chambers associated with testing means, each of a sample test chamber being sized to hold no more than about 0.4 microliter of a blood sample, a driver configured to be coupled to the lancet,

the driver being associated with a driver port; a first seal that seals each of a lancet tip prior to use a second seal adjacent to a lancet head that seals the driver port; a contact interface that aligns the sampling module with a reader device, b) coupling the sampling module to the reader device, c) initiating the blood sampling cycle, d) using the rotating device to rotate the sampling module and advancing the sampling module to bring another sampling segment online, e) repeating steps c) and d) until substantially all sampling segments on the sampling module have been used, and coupling the sampling module and reader device.

42/5,K/3 (Item 3 from file: 5)
DIALOG(R)File 5: Biosis Previews(R)

0019607752 **Biosis No.:** 200700267493

Method and apparatus for a multi-use body fluid sampling device with analyte sensing

Author: Anonymous; **Boecker Dirk; Freeman Dominique M**
Author Address: Palo Alto, CA USA**USA
Journal: Official Gazette of the United States Patent and Trademark Office Patents APR 3 2007 2007
Patent Number: US 07198606 **Patent Date Granted:** April 03, 2007 20070403
Patent Classification: 600-583 **Patent Assignee:** Pelikan Technologies Inc **Patent Country:** USA
ISSN: 0098-1133
Document Type: Patent
Record Type: Abstract
Language: English

Abstract: A device for use with a **penetrating** member driver to **penetrate** tissue is provided. A **plurality** of **penetrating** members are coupled to a single cartridge and are operatively couplable to the **penetrating** member driver. The **penetrating** members are movable to extend radially outward from the cartridge to **penetrate** tissue. A **plurality** of **analyte sensors** are coupled to the single cartridge and are positioned on the cartridge to receive body fluid from a wound in the tissue created by the **penetrating** member.

DESCRIPTORS:
Major Concepts: Methods and Techniques; Clinical Chemistry--Allied Medical Sciences; Equipment Apparatus Devices and Instrumentation
Methods & Equipment: multi-use body **fluid sampling device**--medical equipment;

analyte **sensing device**--medical equipment
Miscellaneous Terms: Concept Codes: penetrating member
Concept Codes:
10006 Clinical biochemistry - General methods and applications
Method and apparatus for a multi-use body fluid sampling device with analyte sensing

Author: ...**Boecker Dirk**... ...**Freeman Dominique M**

Abstract: A device for use with a **penetrating** member driver to **penetrate** tissue is provided. A **plurality** of **penetrating** members are coupled to a single cartridge and are operatively couplable to the **penetrating** member driver. The **penetrating** members are movable to extend radially outward from the cartridge to **penetrate** tissue. A **plurality** of **analyte sensors** are coupled to the single cartridge and are positioned on the cartridge to receive body fluid from a wound in the tissue created by the **penetrating** member.
DESCRIPTORS:
Methods & Equipment: multi-use body **fluid sampling device**--... ...analyte **sensing device**--
Geographical Name:
Miscellaneous Terms: Concept Codes: penetrating member

1. A device for use with a penetrating member driver to penetrate tissue, the device comprising: a single cartridge; a plurality of penetrating members coupled to said single cartridge and operatively couplable to a penetrating member driver, said penetrating members movable to extend radially outward from the cartridge to penetrate tissue; a plurality of analyte sensors each in a sample chamber with the sample chambers being coupled to said single cartridge, each of a sample chamber being positioned on the cartridge to receive body fluid from a wound in the tissue created by each of said penetrating members and having a volume of no greater than 1 microliter; and a position sensor coupled to the plurality of penetrating members, the position sensor configured to provide information relative to a depth of penetration of a penetrating member through a skin surface, the position sensor further configured to provide an indication of velocity of a penetrating member.

10. The device of claim 1 wherein said sample chambers are configured to determine analyte levels using a body fluid sample of less than about 300 nanoliters

12. The device of claim 1 wherein each of said analyte sensors comprises an array of sensors.

23. The device of claim 18 wherein said sample chambers are configured to determine analyte levels using a body fluid sample of less than about 300 nanoliters.

25. A device for use with a penetrating member driver to penetrate tissue, the device comprising: a single cartridge having a plurality of cavities; a plurality of penetrating members coupled to said single cartridge and couplable to a penetrating member driver, said penetrating members being movable to extend outward to penetrate tissue; a plurality of analyte sensors each in a sample chamber with the sample chambers being coupled to said single cartridge, each of a sample chamber being positioned on the cartridge to receive body fluid from a wound in the tissue created by each of said penetrating members and having a volume of no greater than 1 microliter; and a position sensor coupled to the plurality of penetrating members, the position sensor configured to provide information relative to a depth of penetration of a penetrating member through a skin surface, the position sensor further configured to provide an indication of velocity of a penetrating member.

30. The device of claim 25 wherein said analyte sensors are configured to determine analyte levels using a body fluid sample of less than about 1 microliter.

31. The device of claim 25 wherein said analyte sensors are configured to determine analyte levels using a body fluid sample of less than about 300 nanoliters.

41. The device of claim 36 wherein said sample chambers are configured to determine analyte levels using a body fluid sample of less than about 300 nanoliters.

54/5,K/5 (Item 5 from file: 2)
DIALOG(R)File 2: INSPEC

07817282
Title: Miniaturized real-time monitoring system for L-lactate and glucose using microfabricated multi-enzyme sensors

Author(s): Perdomo, J.[1]; Hinkers, H.; Sundermeier, C.; Morell, O.M.; Knoll, M.
Affiliation(s):
[1] Centro de Investigaciones en Microelectron., Inst. Superior Politecnio Jose A, Havana, Cuba
Journal: Biosensors & Bioelectronics , vol.15 , no.9-10 , pp.515-22
Publisher: Elsevier
Country of Publication: UK
Publication Date: Nov. 2000
ISSN: 0956-5663
ISSN Type: print
SICI: 0956-5663(200011)15:9/10L.515:MRTM;1-3
CODEN: BBIOE4
Document Number: S0956-5663(00)00087-7
U.S. Copyright Clearance Center Code: 0956-5663/2000/$20.00
Language: English
Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: A miniaturized on-line **monitoring system** for the **detection** of L-lactate and glucose is presented. The system is based on a microfabricated **multi**-enzyme silicon **sensor** chip with flow channels integrated on the chip. The **sensors** were fabricated in containment technology. They were characterized in test solutions. The crosstalk behaviour was investigated and was found to be practically negligible. The linear **measurement** ranges of both **glucose** and lactate **sensors** were large enough for most practical applications. As a result of the miniaturization the analyte consumption could be reduced to a few nmol min^{-1}. The system was equipped with a microdialysis probe whose recovery was 45% for lactate and 37% for **glucose** in **test** solutions using a flow rate of 3 **mul** min^{-1}. Lower flow rates of 0.5 **mul** min^{-1} resulted in recoveries of over 90%. The long-term **stability** of the system was acceptable. Initial measurements have also been performed in vitro using human blood serum. (*15 refs.*)
Subfile(s): A (Physics); B (Electrical & Electronic Engineering)
Descriptors: biomedical equipment; biomedical measurement; **biosensors**; blood ; electrochemical **sensors**; microfluidics; microsensors; patient **monitoring**; proteins
Identifiers: miniaturized real-time **monitoring system**; L-lactate **sensor**; **glucose sensor**; microfabricated **multi** -enzyme **sensors**; integrated flow channels; crosstalk behaviour; linear measurement range; reduced analyte consumption; microdialysis probe; long-term **stability**; in vitro measurements; human blood serum; integrated microsensors; containment technology; amperometric determination ; enzymatic oxidation
Classification Codes: A8780B (Biosensors); A8770E (Patient diagnostic methods and instrumentation); A0710C (Micromechanical and nanomechanical devices and systems); A8280F (Electrochemical analytical methods); A8280T (Chemical sensors); B7230J (Biosensors); B2575F (Fabrication of MEMS and NEMS devices); B7230M (Microsensors and nanosensors); B7320T (Chemical variables measurement); B7230L (Chemical sensors); B7510 (Biomedical measurement and imaging)

International Patent Classification:
A61B-0005/00 (Measuring for diagnostic purposes; Identification of persons)
B81B (Micro-structural devices or systems, e.g. micro-mechanical devices)
INSPEC Update Issue: 2001-003

Title: Miniaturized real-time monitoring system for L-lactate and glucose using microfabricated multi-enzyme sensors
Abstract: A miniaturized on-line **monitoring system** for the **detection** of L-lactate and glucose is presented. The system is based on a microfabricated **multi**-enzyme silicon **sensor** chip with flow channels integrated on the chip. The **sensors** were fabricated in containment technology. They were characterized in test solutions. The crosstalk behaviour was investigated and was found to be practically negligible. The linear **measurement** ranges of both **glucose** and lactate **sensors** were large enough for most practical applications. As a result of the miniaturization the analyte consumption could be reduced to a few nmol min-1. The system was equipped with a microdialysis probe whose recovery was 45% for lactate and 37% for **glucose** in **test** solutions using a flow rate of 3 **mul** min-1. Lower flow rates of 0.5 **mul** min-1 resulted in recoveries of over 90%. The long-term **stability** of the system was acceptable. Initial measurements have also been performed in vitro using human blood serum.
Descriptors: biomedical equipment; biomedical measurement; **biosensors**; blood ; electrochemical **sensors**; microfluidics; microsensors; patient **monitoring**; proteins
Identifiers: miniaturized real-time **monitoring system**; L-lactate **sensor**; **glucose sensor**; microfabricated **multi** -enzyme **sensors**; integrated flow channels; crosstalk behaviour; linear measurement range; reduced analyte consumption; microdialysis probe; long-term **stability**; in vitro measurements; human blood serum; integrated microsensors; containment technology; amperometric determination ; enzymatic oxidation
International Patent Classification:
A61B-0005/00 (Measuring for diagnostic purposes; Identification of persons...
(**20001100**)

54/5,K/9 (Item 9 from file: 2)
DIALOG(R)File 2: INSPEC

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Title: Characteristics of suction effusion fluid from skin-a new sample for transcutaneous measurement of blood biosubstances
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Abstract: The characteristics of a suction effusion fluid which was transcutaneously obtained from the skin surface by suction was investigated as a new sample for transcutaneous measurement of **blood** biosubstances. The **collection** method for the suction effusion fluid from a rabbit skin without any damage on the skin has been developed by the authors. The steady effusion rate of 0.4 **mul**/min/cm^2 (skin) which was obtained from the rabbit skin eliminated its stratum corneum by the suction pressure of 400 mmHg. Comparative biochemical analysis between the suction effusion fluid and blood indicated that glucose and non protein nitrogens (NPNs) were contained with approximately the same concentration. The concentration of proteins and fats were found to be remarkably small in the suction effusion fluid. These constituents of the suction effusion fluid may lead to an actual long lifetime of **biosensors**. The blood glucose change was detected in the suction effusion fluid with a 15 min delay in response. It was possible to explain this delay by the buffer effect of interstitial volume in the epidermal tissue though there are **many** mechanisms for the delay. This response time was approximately the same as that reported by **biosensors** inserted in subcutaneous tissue. These results encouraged the attainment of transcutaneous continuous **monitoring** of **blood glucose** and/or NPNs by this method. (*15 refs.*)
Subfile(s): A (Physics)
Descriptors: biological techniques and instruments; biomedical measurement; blood; chemical analysis; proteins; skin
Identifiers: nonprotein nitrogens; **biosensor** lifetime; suction effusion fluid; skin; transcutaneous measurement; **blood** biosubstances; **collection** method; rabbit skin; steady effusion rate; stratum corneum; biochemical analysis; glucose; concentration; proteins; fats; blood glucose change; buffer effect; interstitial volume; epidermal tissue; response time
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International Patent Classification:
A61B-0005/00 (Measuring for diagnostic purposes; Identification of persons)
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